

WARM UP PROBLEMS

NEW HAMPSHIRE STATE TEAM
NATIONAL MATHCOUNTS PREPARATION

- (1) How many triangles with integer sides have perimeter equal to 12?
- (2) What is the area of a cyclic quadrilateral with sides of length 2, 2, 3, and 4? What is the product of the diagonals of this quadrilateral?
- (3) How many subsets of the set $\{A, B, C, D, E, F, G, H, I\}$ have an odd number of elements?
- (4) The surface area of a cube is half the volume of the cube. What is the difference in lengths between the space and side diagonals of the cube?
- (5) If Johnny can climb stairs one or two at a time, how many ways can he climb a flight of 10 stairs?
- (6) What is the reciprocal of the sum of the reciprocals of the first 10 integers?
- (7) The diagonals AC and BD of an cyclic quadrilateral intersect at E. If AC is 59, BE is 35, and DE is 18, what is AE?
- (8) A circle has circumference of 12. Let OZ be a radius of the circle and XY its perpendicular bisector. What is the length of chord XY ?
- (9) If the letters in the word “Combination” are rearranged at random what is the probability that the “o”s are not adjacent?
- (10) How many zeros are at the end of $200!$?